



## Tides Canada Innovation Workshop

# Renewable Food for Sustainable Aquaculture

.....the future of world food supply

# Enterra's Mission



## **We farm**

renewable food for animals  
and plants

## **We grow**

natural protein, oils and  
organic fertilizer

## **Our feedstock**

traceable, pre-consumer  
waste food

# Food Production



**What does it cost**

to fuel our resource and  
nutrient intensive food  
production?

# Food Production



Too much.



A fishing boat is shown on the left, pulling a large, circular net that spreads out in a wide circle on the water's surface. The net is made of a fine mesh and has a line of floats along its edge. In the background, there are dark, forested hills and another smaller boat visible on the horizon. The word "Unsustainable" is overlaid in large white text on the right side of the image.

# Unsustainable



Inefficient



# Food Waste



30 to 40%  
Wasted

# Black Soldier Fly

Meet Nature's nutrient renewal experts





# Natural Insect-Rearing Process



# Fishmeal Substitute

**Direct substitute for fishmeal, poultry meal and soybean meal**

- ☐ Atlantic salmon testing complete (DFO, Skretting)
- ☐ trout testing in progress (Barrows, Hardy)
- ☐ tilapia farm test complete (Taplow, Oregon)
- ☐ organic poultry farm testing complete (Union Point)
- ☐ poultry digestibility in progress (U Sask)

**Locally produced from sustainable inputs**

**Predictable pricing and consistent supply**

# Fishmeal Substitute

## Meal product profile

- ☐ 60+ % protein
- ☐ consistent amino acid profile
- ☐ 10 to 15% TFA (75/25)
- ☐ digestibility: 82 % by Atlantic salmon
- ☐ 5 to 30% inclusion rate
- ☐ mycotoxin – below action level
- ☐ microbiology – none detectable
- ☐ metals – below action level
- ☐ <10% moisture, > 1 year shelf life



# Regulatory Picture

## **Canadian Food Inspection Agency (CFIA)**

- ☐ 2 ½ years so far to register novel feed ingredient
- ☐ verification of product from full scale facility
- ☐ anticipated completion in early 2015

## **US Product Sales**

- ☐ approved for sale in Washington State, Oregon, Idaho with California, Utah currently in progress
- ☐ sales completed to Washington State and Oregon
- ☐ AAFCO/FDA registration initiated Feb 2014

# Expansion to 100 tpd Langley Facility



**5,300 m<sup>2</sup> facility**

**7 hectare site**

# Feedstock Testing/Analysis





# Automated Feedstock Processing



# Hatchery Operation



**54 m<sup>3</sup> each**

**2,700 m<sup>3</sup> total**

**8 million flies  
(400 kg total)**



# Insect Rearing

**36,500 tonnes wet feed**

**5,400 tonnes larvae**

**2,700 tonnes fertilizer**

**20,000 tonnes water**

## Larvae growth





# Product Processing/Packaging

**Screened, Washed, Cooked, Dried and Packaged**



Dried Larvae Product

Dried Larvae



Natural Oil



Meal

# Langley Farm Metrics



Enterra



- ✓ Protein and Oils
- ✓ Organic Fertilizer

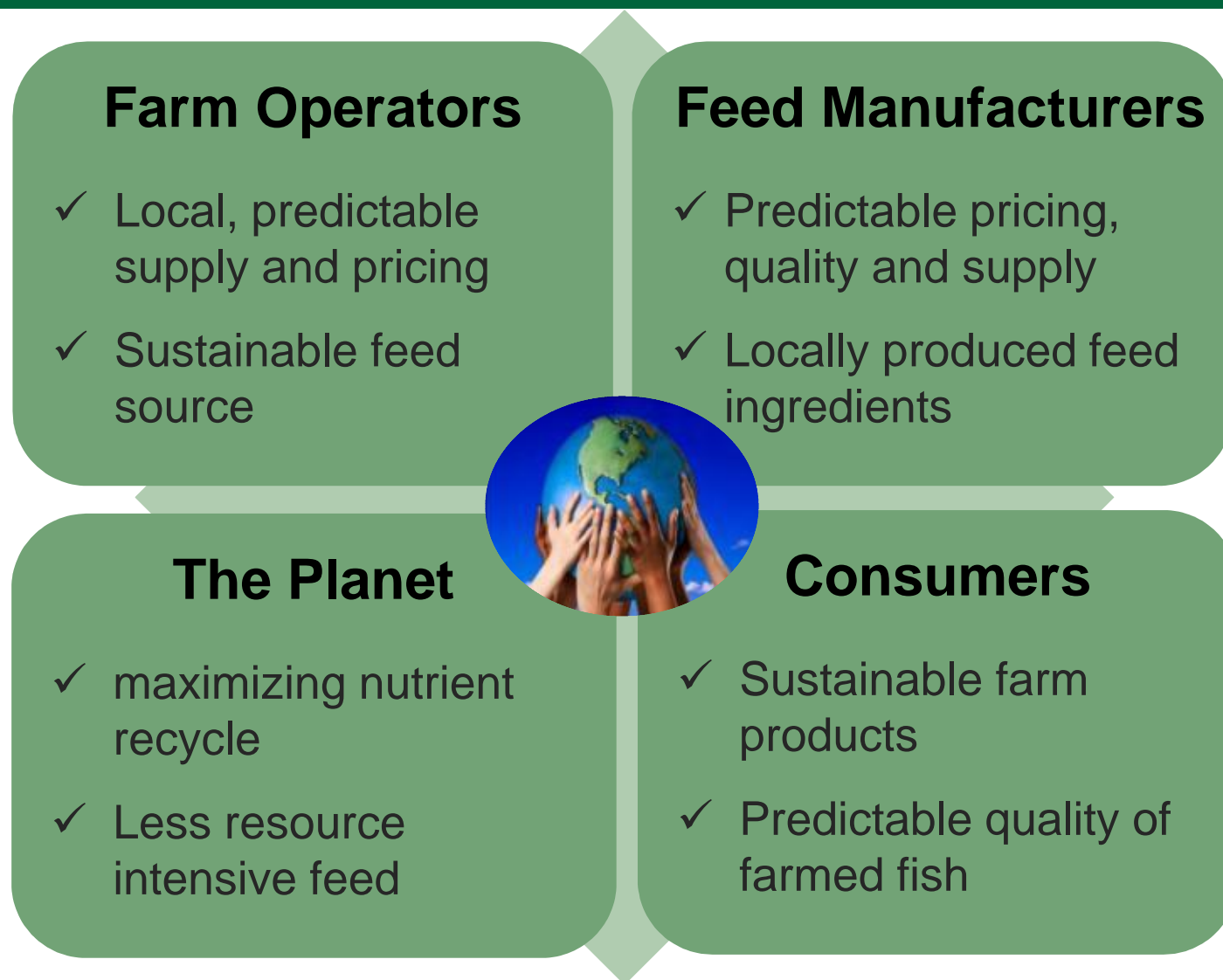
- 36,000 tpy capacity - \$C10 million
- privately financed
- +20 full time jobs
- zero waste from organics
- 100 tonnes food = +60 tonnes product

# Enterra in the Circular Economy





# Benefits for Aquaculture





# Renewable Food For Animals and Plants <sup>TM</sup>

*.....the future of world food supply*